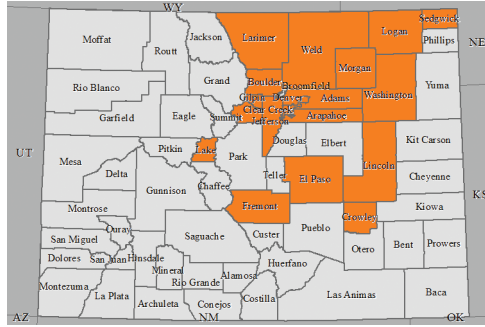


WHAT HAPPENED

Beginning September 9, 2013, a cold front coupled with warm and moist air from the Gulf stalled over Colorado to generate heavy rainfall. In Boulder, up to 17 inches of rain fell by September 15. The National Oceanic and Atmospheric Administration determined this event amounted to a maximum 1,000-year rainfall event (0.1% annual probability) in some locations.

The unprecedented rainfall resulted in catastrophic flooding along Colorado's Front Range of the Rocky Mountains impacting 18 Colorado counties and 132 jurisdictions. The most substantial flood damage occurred in Boulder, Larimer, and Weld Counties, which also have some of the highest-rated National Flood Insurance Program (NFIP) Community Rating System (CRS) communities.



Location of the 18 impacted counties as a result of the 2013 Colorado flood event.

Please refer to the following resources for more information on higher regulatory standards, mitigation planning, and the 2013 Colorado flood event.

Floodplain Management – <http://www.fema.gov/floodplain-management>

Building Science Publications – <http://www.fema.gov/building-science-publications>

Colorado Water Conservation Board – Floodplain Management Program – <http://cwcw.state.co.us>

Colorado Action Plans for Disaster Recovery – <http://dola.colorado.gov/cdbg-dr/content/action-plans>

Contact

Federal Emergency Management Agency
FEMA Region VIII
Denver Federal Center
Building 710,
Box 25267
Denver, CO 80225
(303) 235-4800
<http://www.fema.gov/region-viii-co-mt-nd-sd-ut-wy>



INFORMATION AND RESOURCES

LOSSES AVOIDED

FEMA Region VIII conducted a Losses Avoided study to examine the impact of floodplain regulations and policies on flood losses in Boulder, Larimer, and Weld Counties and how higher regulatory standards can help reduce future flood damage and create more resilient communities. Losses Avoided studies compare two damage scenarios: losses before and losses after regulatory measures are implemented and strive to answer the questions:

- What would have happened if regulatory measures were not implemented?
- Can a dollar value be put on the savings?

The results of the analysis are highlighted in this brochure.



Reducing Losses Through Higher Regulatory Standards

A Study of the 2013 Colorado Floods

Region VIII
March 2015



FEMA

HIGHER STANDARDS

Jurisdictions can become more resilient by taking the following actions:

- Adopting and enforcing higher floodplain management standards than National Flood Insurance Program (NFIP) minimum requirements (see the examples below)
- Promoting open space through property buyouts and community planning
- Encouraging responsible building practices
- Maintaining rigorous enforcement



Open space preserved in McMurry Natural Area and Legacy Park along the Poudre River in Fort Collins. Floodwaters in the September 2013 event were able to spread out and slow down and not cause damage.

BEST PRACTICES

Best practices are mitigation measures proven to be effective in reducing flood damages and economic losses. FEMA Region VIII performed a study to evaluate regulatory best practices. Regulatory best practices determined to have the most impact were: requiring increased freeboard, restricting floodplain development, and restricting construction of basements in floodplain areas.

FINDINGS

Floodplain

Regulating floodplain development when the community entered the NFIP (referred to as “earlier”) would have resulted in 36% estimated losses avoided in Boulder and more than 53% estimated losses avoided in Larimer and Weld after the 2013 Colorado flood event.

Estimated Losses Avoided 36% in Boulder >53% in Larimer and Weld

Floodway

Regulating floodway development earlier for the 100-year event would have resulted in estimated losses avoided of \$32 million for Boulder, \$64 million for Larimer, and \$13 million for Weld.

Estimated Losses Avoided \$32m for Boulder \$64m for Larimer \$13m for Weld

Freeboard

For the 100-year and 2013 events, if freeboard was increased by 2 feet, estimated losses would have decreased by more than 70 percent in Boulder, Larimer, and Weld Counties.

Decrease in Estimated Losses >70%

In Boulder County, if freeboard had never been adopted for the 100-year event, there would have been a 331% increase in losses or \$1.5 billion additional losses.

The results show that adopting higher floodplain regulations results in benefits to jurisdictions and that not implementing regulations can result in a substantial increase in losses. This information can be used by floodplain managers and jurisdictions to support the case for implementing higher regulatory standards, in addition to conducting standard mitigation projects like acquisition and elevation.

WHAT CAN YOU DO?

The Losses Avoided study shows that both a community or property owner actions can reduce future losses.

Communities

Become an NFIP participating community. Joining the NFIP allows property owners within a participating community to purchase NFIP flood insurance and receive disaster assistance for flood-related damage.

Adopt higher standards. Higher standards can be adopted at any time. With higher standards, a community can expect faster recovery from flooding events and reduced financial and physical effects on individual property owners. Higher standards provide a good foundation for joining the CRS and passing along reduced flood insurance premiums to residents.

Property Owners

Know your risk. To reduce your flood risk, you need to know your level of risk. Flood hazard maps show different degrees of risk and help determine the cost of flood insurance. To identify the risk, visit FEMA’s Map Service Center (<http://msc.fema.gov>) to see an online map or visit your local floodplain administrator.

Reduce your risk. If located in a high-risk zone, consider elevating your structure, installing approved flood vents, or partially filling in enclosures. These actions could reduce your flood insurance premium.

Insure your risk. Another way to reduce flooding impacts is to purchase flood insurance through the NFIP. Premium discounts are available if your community participates in the CRS. If your community does not participate, encourage your community leaders to join.